

Occurrence of *Cancellaria patricia* Thiele off South-East Australia; with notes on three Australian taxa of Cancellariidae (Neogastropoda: Cancellarioidea)

André Verhecken

Scientific Collaborator, Recent Invertebrates Section, Koninklijk Belgisch Instituut voor Natuurwetenschappen, Vautierstraat, 24, B-1040 Brussels, Belgium.

ABSTRACT

The Australian locality of *Cancellaria exigua* Smith is confirmed, and its holotype redescribed. The species mentioned under that name by Garrard (1975) is identified as *C. patricia* Thiele; this is the first mention of that species for Australia. *Inglisella nympha* Garrard is found to be a junior synonym of *C. exigua*. A damaged shell from New South Wales is identified as the third known specimen of *Bonellitia scobina* (Hedley & Petterd).

INTRODUCTION

Cancellaria exigua E. A. Smith, 1891, is a minute species described for a single empty shell taken by the 'Challenger' expedition off Sydney in about 740 m depth. However, there has been considerable uncertainty regarding the collection locality of this specimen. In the paper describing that species, Smith (1891: 436) stated: "at this station 164B in addition to the new species described were a number of others, and amongst these several undoubtedly Atlantic forms". Later (1894: 59) he repeated his doubts, also citing Watson's (*). The correct labeling of material from Challenger Station 164B was further disputed by Pilsbry and Sharp (1897: 122) and by Hedley (1901: 22). A search in the literature prior to 1975 did not yield any evidence of another specimen of *C. exigua* taken in Australian seas. Finlay's (1930: 241) statement "*Microsveltia recessa* Iredale was compared with the Recent *Cancellaria exigua* Smith, with one plait . . ." is almost certainly a mere reference to Iredale's paper (1925: 265). Laseron (1955: 271) even thought that this species should be removed from the list of New South Wales Cancellariidae. In fact, the large number of Atlantic species found in the material labeled 'Station 164B' suggested an Atlantic origin of this sample, and an incorrect labeling of a Central Atlantic sample was proposed (Hedley, 1901: 24); a mixup of it with Australian material was also possible.

This problem seemed to be solved when Garrard (1975: 35), in his study of Australian Cancellariidae, mentioned a minute species "from deep to very deep

(*) This probably refers to a verbal statement by Watson, since I could not locate such statement in his "Challenger" reports.

water" off the East Australian coast, and identified it as *Gergovia exigua* (Smith, 1891). Apparently, the Australian locality of this species was correct indeed.

This question needed a final answer in the context of a study of the Eastern Atlantic Cancellariidae (Verhecken, in preparation), since *C. exigua* must be either Australian or Atlantic. Results obtained while working on this problem are given in the present paper.

MATERIAL STUDIED

Cancellaria exigua Smith, 1891.

The exact identity of the material cited by Garrard (1975: 35) as *Gergovia exigua* (Smith) is difficult to ascertain from the paper, since his figure of it (1975: fig. 4 [1]) can hardly be used for identification. Therefore, the material studied by Garrard was compared with the holotype of that species (BMNH 1889.10.12.16). This clearly showed that the shells are not conspecific (cfr. figs. 1-2 and 11). Differences are: (a) *C. exigua* is more slender than the Australian shells studied by Garrard, and has a much weaker sculpture; (b) form of columella and columellar folds is quite different. This means that *Gergovia exigua* (Smith) *sensu* Garrard cannot be identified with *Cancellaria exigua* Smith; consequently the Australian locality of Smith's species is not confirmed here.

Direct evidence of the real locality of the holotype of *C. exigua* could possibly be obtained from the study of the Foraminifera in the sediment contained in this shell's aperture. The few specimens that could be isolated were identified by Dr. H. Hooyberghs (KUL) as the following pelagic Foraminifera, distributed in rather distinct latitudinal belts (Bé & Tolderund, 1971: 106): *Globorotalia crassaformis* (Galloway and Wissler), a mesopelagic species in subtropical to tropical waters (Bé & Tolderund, 1971: 122); *Globorotalia inflata* (d'Orbigny), the only indigenous species of the Northern and Southern Transition Zone (Bé & Tolderund, 1971: 119); *Globigerina bulloides* d'Orbigny, a dominant species in subarctic and subantarctic waters (Bé & Tolderund, 1971: 119); *Globigerina pachyderma* (Ehrenberg), the best indicator species of polar waters (Bé & Tolderund, 1971: 113); *Globigerinoides quadrilobatus* (d'Orbigny), which is universally distributed from the Burdigalian (Miocene) on (Hooyberghs, in litt.); and *Globoquadrina dutertrei* (d'Orbigny), a subtropical to tropical species with its distributional limits located within the Transition Zones (Bé & Tolderund, 1971: 122).

Because of the wide distribution (also north and south of the Equator) of these pelagic species, no final answer can be deduced from these data as to the locality of the holotype of *C. exigua*. They only suggest a locality in a North or South Transition Zone (cfr. Bé & Tolderund, 1971); both the North Atlantic and the South Pacific off Australia are candidates.

Redescription of *Cancellaria exigua* Smith.

The confusion of the southeastern Australian species with *C. exigua* indicates that Smith's description insufficiently characterises his taxon; therefore the holotype of *C. exigua* is here redescribed.

Shell small, elongated; colour whitish; dimensions 5.9 x 3.1 mm. Protoconch paucispiral, with one smooth inflated whorl (counted according to Verduin, 1984: 38 fig. 1), slightly deviated. Maximum diameter 0.9 mm, visible height 0.8 mm. Transition to teleoconch clearly marked. Teleoconch with 3 1/4 slightly rounded whorls, suture slightly impressed. Spiral sculpture of two thin low spiral ridges per whorl; the body whorl has three spirals. Area between suture and adapical spiral

very steep, almost unsculptured. Axial sculpture hardly discernible on first teleoconch whorl; 11 and 15 low narrow ribs on second and third whorl respectively. Tiny nodules are formed on crosspoints with spiral sculpture. Aperture semicircular, height 2.3 mm, width 1.4 mm. Outer lip smooth, not flared out; with no inner lirae. Columella with one low rounded fold; rim of the columella curved as to form a relatively wide siphonal canal. Umbilicus completely closed.

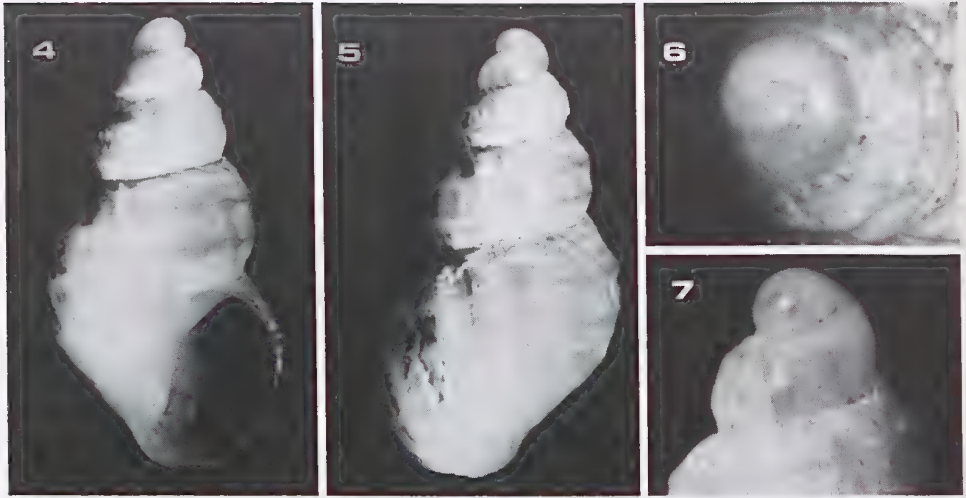
***Inglisella nympha* Garrard, 1975.**

Since the Australian species identified by Garrard as *G. exigua* (Smith) is definitely not the species introduced by Smith, and the Foraminifera identification did not allow a clear conclusion as to its locality, the Australian origin of Smith's holotype would seem still more doubtful now than it already was. However, Garrard (1975: 40) also described the new species *Inglisella nympha* from a depth of 860 m off Green Cape, New South Wales; his figure of the holotype (AM C.89280) has a very strong resemblance to Smith's figure of the holotype of *C. exigua*. Therefore, these holotypes were studied together, and proved to be conspecific beyond doubt (see figs. 1-3 and 4-6); the only minor difference being the slightly more pronounced sculpture of *C. exigua*. Garrard (1975: 40) states in his discussion that *I. nympha* has no axial ribbing; in his description he mentions "heavy growth lines, simulating narrow axial ribs", which he refers to as "pseudo 'ribs'". The distinction between the 'ribs' of *C. exigua* and the 'pseudo-ribs' of *I. nympha* is only a matter of gradation.

This identification of *Inglisella nympha* Garrard, 1975, as a junior subjective synonym of *Cancellaria exigua* Smith does now confirm the Australian locality of the latter taxon. Evidently, there is the theoretical possibility that this species might occur both in the North Atlantic and off southeastern Australia. However, in my opinion this possibility can be excluded, taking into account the paucispiral protoconch of this species, indicating a direct development of its larvae without a planktonic stage. Moreover, *C. exigua* has never been reported from the Atlantic.



Figures 1-3. *Cancellaria exigua* Smith. 1-2, holotype (BMNH 1889.10.12.16), 5.9 x 3.1 mm. 3, protoconch, diameter 0.90 mm.



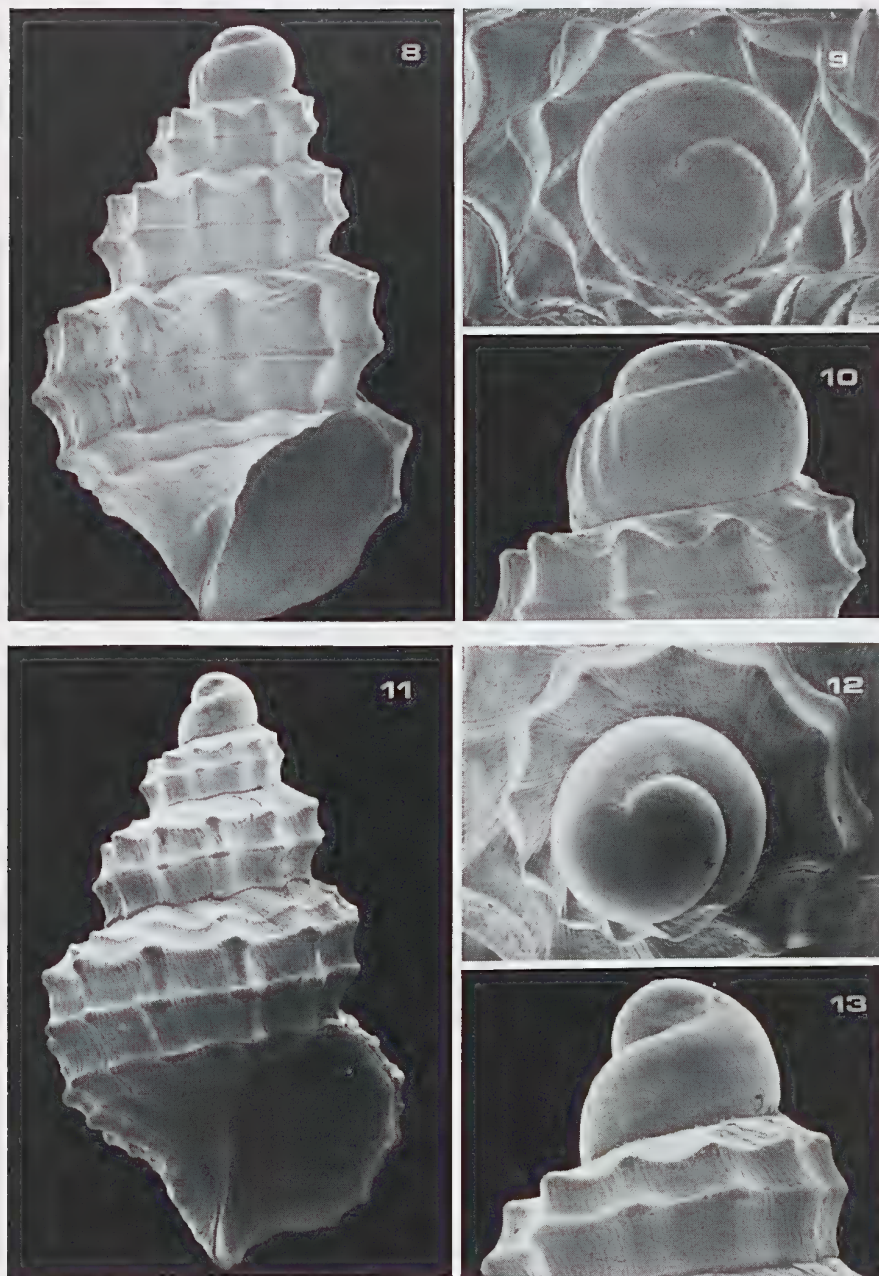
Figures 4-7. *Inglisella nympha* Garrard. 4-5, holotype (AM No. C.89280), 6.7 x 3.5 mm. 6-7, protoconch, diameter 0.95 mm.

Cancellaria patricia Thiele, 1925.

Gergovia exigua (Smith) *sensu* Garrard is not the species described by Smith, consequently its real identity poses an additional problem. A literature search suggested that it is conspecific with *Cancellaria patricia* Thiele, 1925, a deep water species described from the Zanzibar Canal, 5° 27.9' S, 39° 18.8' E, 463 m. Thiele (1925: 200) mentioned 'several' shells, partly with the animal still inside. This material was received on loan from Zoologisches Museum der Humboldt-Universität, Berlin, Germany; it contained 30 specimens labeled "Typen 2 + 28 Exemplare von 'Valdivia'-Stat. 245". To the best of my knowledge, this species was never cited again in the literature subsequent to its original description. Since Thiele did not designate a type and figured only one shell, the type labeling cannot be explained and is here disregarded.

Unfortunately, the 'Valdivia' material arrived only after expiration of the loan period of the Australian material, so that a direct comparison of both lots was not possible. In spite of this, it could be established the Zanzibar Channel lot and the southeastern Australian lot are very near in form and sculpture. The following minor differences were found: (a) shell height: up to 4.7 mm for up to 3 3/4 teleoconch whorls (syntypes) versus 7.2 mm for 4 teleoconch whorls (Australian shells); (b) the Australian specimens have a pointed sculpture less prominent than in the African shells, they have on the basal part of the body-whorl up to four minor spiral ridges, whereas the African shells have only one ridge in that region (cfr. Thiele, 1925: pl. 34 fig. 20); (c) the protoconch of the syntypes is more inflated than that of the Australian specimens (figs. 9-10, 12-13); (d) the Australian specimens may have up to two minor spiral ridges on the sutural ramp of the third or fourth teleoconch whorl, and faintly indicated secondary spiral lines between the main spirals of that whorl.

However, these differences are here considered of minor importance. They are probably only local variations between both distant localities, East Africa and southeastern Australia, or may be adaptations to a different bathymetry (see



Figures 8-13. *Cancellaria patricia* Thiele. 8, Syntype (ZMB, unnumbered shell), 4.3 x 2.6 mm, Zanzibar Channel, 463 m. 9-10, protoconch of same shell, diameter 0.63 mm. 11, specimen from 155 m, S.E. of Lakes Entrance, Victoria. ex T. A. Garrard coll. (AM C 89272), 5.25 x 3.22 mm; 12-13, protoconch of same specimen, diameter 0.6 mm (SEM-photographs 8-10 were taken without any conductive coating on shell).

further). Moreover, because of its small size and deep habitat, the species may have escaped observation in localities in between. Also, even if taken, the species may have remained unidentified and unreported, since the species was never mentioned in general malacological works. Therefore, I see no reason yet to separate both populations on subspecific level. Thiele's figure shows two columellar folds; these are indeed present on all specimens studied, but the posterior one may not always be clearly visible in the normal viewing position, e. g. fig. 11.

On loan from AM, 43 specimens were studied. They conform well Garrard's description given for "*Gergovia exigua* (Smith)"; there may be up to four teleoconch whorls; shell dimensions up to 7.2 x 4.2 mm; the larger specimens may have six lirae inside the outer lip and a very narrow umbilicus. Australian distribution: (cfr. Garrard, 1975: 35) Queensland: 2 specs.; New South Wales: 13 specs.; Victoria and Bass Strait, Tasmania: 29 specs. Bathymetric distribution of these specimens: 75-200 m: 37 specs.; 200-405 m: 4 specs.; 1463 m: 1 spec.; beach: 1 spec. (cfr. Garrard's note on this specimen). According to its depth distribution, this species seems to be a continental shelf inhabitant in southeastern Australia, the Zanzibar Channel lot living deeper (463 m).

It is remarkable that this taxon is not mentioned in the Australian literature prior to 1975, especially since three lots labeled "T. Iredale coll." are present in AM. The incorrect labeling as *C. exigua* Smith is no explanation: there were no unequivocal references to specimens under this name either, and Iredale's (1925: 265) statement on *Microsveltia recessa*: "Near *C. exigua* Smith and *C. micra* Tate, but not identical with either" is no proof that he had before him a specimen of *C. exigua*, since he cites only data given by Smith.

Microsveltia recessa Iredale, 1925, has a sculpture similar to that of *C. patricia*, but stronger (Garrard, 1975: 36). It has shouldered whorls, a bright chestnut brown colour and a fine bristly greenish-brown periostracum. In contrast, *C. patricia* is off-white, has flatly convex whorls, and only on a few of the 30 East African specimens a very thin almost colourless periostracum is present. *M. recessa* lives in the same area as *C. exigua*.

***Bonellitia scobina* (Hedley and Petterd, 1906)**

Among the AM material studied of *Cancellaria patricia*, one specimen from a lot of two is clearly different from that species. The lot is labeled "C 102564; S.E. of Clarence River, NSW. 29° 41-32'S; 153° 45-47' E, 405 m, 10 Oct. 1975, coll. K. J. Graham, FRV 'Kapala' ". This shell was here tentatively identified as *Bonellitia scobina*; the identification was later confirmed by Mr I. Loch, AM (in litt., 26 Feb. 1990). This taxon was stated to be known until now only from its holotype (Garrard, 1975: 34). It must be remarked however, that BMNH has a specimen from "E. of New South Wales" labeled under that name; its identity has not been checked for this study. It appears that the AM shell reported here is the third known specimen of this species. Unfortunately, this shell (fig. 14) has a large hole of a quarter whorl on the ventral side of the body-whorl, apart from a bore-hole near the top, and it has the rim of the outer lip broken.

General remarks

The species cited in this paper have been placed in several genera: *Cancellaria*, *Gergovia*, *Inglisella*, *Microsveltia*, and *Oamaruia* Finlay, 1924 (on labels in AM.). The problem of the correct generic names for '*Cancellaria*' *exigua* Smith, and '*Cancellaria*' *patricia* Thiele is not treated here: it is preferred to await a good study of the numerous cancellariid genera before making a judgement on this matter. For



Figure 14. *Bonellitia scobina* (Hedley & Petterd), third known specimen (AM C102564) 7.0 x 4.5 mm, S.E. of Clarence River, NSW, 405 m.

the time being, the use of *Cancellaria* s. l. is here maintained, although inclusion of *C. exigua* in the genus *Brocchinia* Jousseaume, 1887, seems a reasonable choice.

While studying the descriptions given by Garrard (1975) it should be remembered that the count of protoconch whorls used by that author differs from that by Verduin (1984) which is used here.

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